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unpatentable over Morton (U.S. Pat. No. 5,693,947) in view of Perez-Mendez (U.S. Pat. No. 5,596,198) and Schiebel et al. (U.S. Pat. No. 5,396,072).

This rejection is respectfully traversed for the following cogent reasons:

According to MPEP 2143, a basic requirement of a *prima facie* case of obviousness is that "...the prior art reference (or references when combined) must teach or suggest all the claim limitations". Furthermore, according to MPEP 2143.01, the prior art must suggest the desirability of the claimed invention.

Claim 1 of the present application defines an indirect x-ray image detector for radiology comprising an active matrix substrate with scanning and read-out circuits, wherein over said active matrix substrate there is deposited a photoreceptor made of a co-planar thin layer of amorphous selenium based multilayer structure, said photoreceptor being covered with a light-transparent biasing electrode on top of which there is provided an x-ray conversion scintillator.

In the past, the Examiner has rejected this claim as being obvious in view of Morton and Schiebel et al. The applicants have argued in their previous responses that Morton does not describe nor suggest an indirect x-ray image detector suitable for radiology that uses a photoreceptor made of a co-planar thin layer of amorphous selenium-based multilayer structure. In fact, Morton does not mention a co-planar photoreceptor at all. He just considers that other receptors than a-Si could be used and implicitly suggests that, as a-Si, they would be pixelated. In column 10, lines 48-49, Morton states that amorphous selenium is useful for detecting  $\alpha$ ,  $\beta$ ,  $\gamma$  and X-ray, but does not mention that it can detect light as is the case of the present invention. Thus, if anything, Morton teaches away from the invention as claimed in claim 1.

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With regard to Schiebel et al. it was already pointed out to the Examiner that it makes no sense to combine it with Morton, because this reference concerns only direct conversion of x-rays into a thick photoreceptor layer. This reference is therefore totally irrelevant to the present invention as claimed in claim 1.

In spite of the above cogent arguments which have already been discussed in great detail previously, the Examiner has come back with the rejection of claim 1 based on a combination of the above two references with a new one, namely Perez-Mendez. How can two references, that are not combinable, because they relate to different types of x-ray conversion systems, can become suddenly combinable and relevant by adding a new reference dealing with another completely different structure and application, namely a gamma ray camera based on a pixel photosensor array? This is not understood nor accepted.

The Examiner has referred to the disclosure in the Perez-Mendez patent where, in column 6, lines 60-67, it is stated that a p-i-n structure can be formed of hydrogenated amorphous silicon (a-Si:H) and alternatively of materials such as amorphous selenium, antimony trisulphide, cadmium sulphide, antimony sulphide oxysulphide and crystalline materials such as Si, Ge, gallium arsenide and their alloys. This is provided in conjunction with a photosensor array 32 (c.f. column 6, line 57) which is a pixilated photosensor array as mentioned in column 8, lines 12-15, and illustrated in Fig. 5 of the Perez-Mendez patent and used for the gamma ray camera shown in Fig. 1. Thus, the special resolution in Perez-Mendez comes from a pixilated array of pixel diodes 67-70 with separations 71, 72 therebetween for circuit interconnections (c.f. column 7, lines 60-61 and Fig. 4). In fact, a solid state gamma ray camera is necessarily pixilated to reduce to a minimum the read-out capacitance of a multiplicity of local detectors. This is completely different and disconnected from the application proposed in the present invention as claimed in claim 1, where the photoreceptor is

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made of a co-planar thin layer of amorphous selenium based structure which, as explained at the very beginning of the application (c.f. page 1, lines 7-11) is intended to replace the usual array of pixelated photodiodes such as used by Perez-Mendez. In fact, the surface resistance of a co-planar selenium photoreceptor would simply be counterproductive in a gamma ray camera where the selenium material would have to be very conducive and quite thick to allow good nuclear event detection.

Thus, it is submitted that there is nothing in Perez-Mendez that would even hint at the possibility of using a co-planar thin layer of any material as a non-pixelated photoreceptor that would be capable to convert light into electrical charges, let alone the desirability of using specifically a co-planar thin layer of amorphous selenium based multilayer structure as defined in claim 1 of the present application. Perez-Mendez, therefore, cannot be properly combined with Morton for the purposes of claim rejection under 35 USC 103.

Contrary to the Examiner's contention, it is submitted that the use of a photoreceptor made of a co-planar thin layer of amorphous selenium based multilayer structure in an indirect x-ray image detector for radiology is entirely novel and non-obvious over the cited prior art. Moreover, as indicated on page 6, line 21 to page 7, line 4 of the application, the role of the selenium multilayer is two-fold. Firstly, it acts as the light absorber layer thereby converting the incident energy into electrical charges proportional to the intensity level of the incident radiation, and secondly, it acts as the charge transport layer whereby the generated carriers are transported under the effect of an applied electric field to the underlying electrode. Also, as disclosed on page 6, lines 15-16, and claimed in claims 20, it can be matched with blue scintillators, such as the cesium iodide doped with sodium which is the only scintillator found in the large industry of X-ray image intensifiers. None of the cited references provide for such effects.

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With hindsight of applicant's disclosure, the Examiner combined and modified the Morton, Perez-Mendez and Schiebel et al. references so as to fit the present invention as claimed in claim 1 and the other rejected claims without taking into account the explanatory notes MPEP 2143.01 where it is clearly stated that "the fact that references can be combined or modified, is not sufficient to establish *prima facie* obviousness, unless the prior art also suggests the desirability of the combination (In re Mills, 916 F.2d 680, 16 USPQ 2d 1432, Fed. Cir. 1990).

Based on the above, it is submitted that the rejection of claim 1 and of the other claims (all of which directly or indirectly depend on claim 1), is improper and that these claims are drawn to allowable subject matter for reasons explained above.

It is, therefore, believed that all claims now in this application are in condition for allowance, and an early favorable action is therefore solicited.

The Examiner is invited to call applicant's agent if any questions remain following review of this response.

Respectfully submitted,



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